Horizontal Fusion
Standards and Specifications

Department of Defense Assistant Secretary of Defense for Networks and Information Integration/DoD CIO

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Revision Sheet

Release No.	Date	Revision Description
Ver. 1.0	05/16/2003	Horizontal Fusion Standards and Guidance Version 1
Ver. 2.0	03/08/2004	Horizontal Fusion Standards and Guidance Version 2
Ver. 3.0	04/08/2004	Horizontal Fusion Standards and Guidance Version 3
Ver. 4.0	11/03/2004	Horizontal Fusion Standards and Guidance Version 4 - First release in conjunction with Horizontal Fusion Developers Guidance and Developers Reference - Updated to provide a more active list of standards that Horizontal Fusion is leveraging - Document Name Change

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1 INTRODUCTION

Horizontal Fusion was established by the Assistant Secretary of Defense for Networks and Information Integration (ASD/NII) in January 2003 to explore and investigate the potential feasibility of implementing an interoperable Net-Centric services-oriented architecture (SOA) environment for the Department of Defense (DoD). The introduction of a Net-Centric environment and SOA for the Department will deliver significant improvements in battlefield operations, including near-real time access to critical information, enhanced situational awareness (both on the battlefield and globally), informed and expeditious command decision-making, and controlled and coordinated operational and tactical military movements.

In addition, Horizontal Fusion was directed to implement a new approach to information technology (IT) management within the Department—Portfolio Management. Portfolio Management marks a significant change from existing management practices, under which purchasing decisions are made on a program-by-program basis. The Portfolio Management approach, according to the "Information Technology Portfolio Management" policy directive of 22 March 2004 issued by Deputy Defense Secretary Paul Wolfowitz, will ensure that the military possesses the "right capabilities to perform its mission and conduct effective operations, eliminate outdated ways of doing business, and achieve DoD's Net-Centricity goals." All DoD IT investments and programs will be managed as portfolios in the near future.

Horizontal Fusion is a direct response to operationalize, integrate, and optimize technology and operations to achieve "Power to the Edge" in the new battlespace. Horizontal Fusion is made possible by the new technology context that includes Wideband Satellite Communications (SATCOM), Global Information Grid Bandwidth Expansion (GIG-BE), and the Joint Tactical Radio Systems (JTRS). The increased bandwidth these capabilities will provide will deliver significant improvements in battlefield operations including real-time access to critical knowledge and enhanced situational awareness, informed and expeditious command decision-making, and operational and tactical response.

The Horizontal Fusion Portfolio Initiative is a management process with an emphasis on outcome-based performance intended to accelerate the transition of Net-Centric warfighting capabilities into the operational inventory.

The Horizontal Fusion Portfolio is a set of technologies and processes that have been selected to demonstrate their interoperability with other Initiatives of the Portfolio and their contribution to the overall concepts of Net-Centricity.

The intent is to accelerate the transition of Net-Centric warfighting from vision to reality. The Portfolio Initiative emphasizes outcome-based performance. Goals are closely aligned with the DoD vision of Transformation to Net-Centricity, with the objective of building practical solutions. The Portfolio composition is guided by the overarching criteria of Fit, Balance, and Impact.

1.1 Purpose

The Horizontal Fusion Portfolio consists of a wide range of Initiatives that developed a product for the Portfolio or integrated existing products into the SOA. The Horizontal Fusion Developers Guidance Document, Developers Reference Document, and Standards and Specifications Document are designed to help new ~~members~~ Initiatives of the Portfolio as well as existing members.

1.1.1 Standards and Specifications Document

The purpose of the Standards and Specifications Document is to provide direction to the Horizontal Fusion Portfolio Initiatives towards the development of web services and data management standards. Many of these standards are geared toward developers; however, anyone involved in networking, document creation, or general file releases can benefit from this document.

1.1.2 Developers Guidance Document

The purpose of this document is to provide guidance to current and new developers of the Horizontal Fusion Portfolio The focus of this document is to provide brief descriptions of the most commonly used technologies including: Extensible Markup Language (XML), Web Service Description Language (WSDL), and Universal Description, Discovery and Integration (UDDI) as well as the ~~Net Centric~~ Core Enterprise Services (CES). In addition to these descriptions, this document will provide reference material to aid Initiative developers in their planning and development process. This document is not intended to be a 'how to' document; rather, this document provides a brief overview of the technologies and guidelines on how ~~ways~~ to implement these technologies.

1.1.3 Developers Reference Document

The Developers Reference document is intended to provide comprehensive descriptions as well as technical interface documentation of the CES. The Developers Reference Document is the most technical of the three developers guides.

The largest portion of the Reference Document is the documentation on the CES. The CES include:

- Security Services
  - Security Adjudication Service (Classification Policy Decision Service)
- Service Discovery Services
- Content Discovery (Federated Search)
- Mediation Messaging
- Syndication: Alerts
- Person Discovery

- Collaboration Services

Please refer to the Developers Reference document for detailed information on these services.

In addition to WSDL and Service documentation, the Developers Reference document will provide information and reference material for any software development kits (SDK) that these providers have developed and released. Developers can leverage existing technologies and software. SDKs help developers interface with the services without having to write an extensive coding interface.

1.2   Current Versions

The Horizontal Fusion Standards and Specifications Document refers to the latest version of both the Developers Guidance and the Developers Reference Documents at the time of its publishing. In some cases, documents will change to incorporate updated guidelines, specifications, or technical information. Always check to find the latest approved version of these three documents.

1.3   Types of Audiences

Due to the nature of the Horizontal Fusion Portfolio, many different groups and types of users are directed to this document. Each individual, system, or group belongs to at least one of four categories: 1) Service/Data providers, 2) Core Infrastructure providers, 3) Portal/Portlet Builders, or 4) End-Users.

1.3.1   Service/Data Providers

A Service Provider is the owner of the service and serves as a "service container" of the web services. A service provider may host one or more web services with more than one physical machine. The goal of Service Providers is to easily define new services, publish them, and manage them. A Data Provider develops and maintains the content of information and makes it available to users requesting specific data.

1.3.2   Core Infrastructure Providers

Core Infrastructure Providers:

- Security
- Discovery
  - ❑ Content
  - ❑ Person
  - ❑ Metadata
  - ❑ Service

- Mediation
- Collaboration
- C2 Visualization
- Enterprise Service Management (ESM)
- Storage

1.3.3 Portal/Portlet Builders

A portal is an integrated web-based view providing a convenient interface to numerous applications. To make applications available to a portal, interfaces must be implemented between the portal and application. These interfaces, or portlets, are Java-based Web components that process requests and generate dynamic content. A portlet contains the code that links to the backend application as well as the code that displays the application within the portal. Portals use portlets as pluggable user interface components that provide a presentation layer to information systems.

1.3.4 End-Users

End-Users include DoD Command and Control, U.S. Government agencies, and Intelligence participants.

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2   STANDARDS

The Horizontal Fusion standards will be derived from a set of Industry and International standards, the Joint Technical Architecture (JTA) version 4.0, and the Horizontal Fusion application specifics standards.

Horizontal Fusion will also engage in new and emerging standards, specifically in the area of Portal/Portlet and Web Services. DIA's Joint Intelligence Virtual Architecture (JIVA) version 1.0, 07 August 2002 provides a set of emerging standards that are applicable for the development of the Horizontal Fusion effort.

The JTA version 6.0, 6 October 2003 (Uniform Resource Locator (URL): http://jta.disa.mil/) provides baseline technical standards in the area of Information Processing Standards, Information Transfer Standards, Information Modeling, Metadata, Information Exchange Standards, Human Computer Interface Standards, and Information Security Standards.

Other guidance documents include the latest versions of the Horizontal Fusion Developers Guidance and Developers Reference documents.

2.1   Development Standards

This section provides developmental standards. These standards, outlined in Table 2.1 Development Standards, include the guidelines for technologies used by Horizontal Fusion Portfolio Initiatives.

Standard	Version	Description	References
ANSI/ISO/IEC 9075-1-5:1999	Final	Information technology–Database languages–SQL–Framework, Foundation, Call-Level Interface, Persistent Stored Modules, Host Language Bindings.	http://www.ansi.org/
JSR 109	Final	Web Services in Java	http://www.jcp.org/en/jsr/detail?id=109
JSR 110	Final	Java API's for WSDL	http://www.jcp.org/en/jsr/detail?id=110
JSR 168	Final	Java Portal Standard API's	http://www.jcp.org/en/jsr/detail?id=168
JSR 40	Final	Java Metadata Interface (JMI)	http://www.jcp.org/en/jsr/detail?id=40
UDDI	2.0	Universal Description, Discovery and Integration	http://www.uddi.org/
WS-I Profile	1.0	A set of non-proprietary Web services specifications, along with clarifications to and amplifications of those specifications which promote interoperability	http://www.ws-i.org/Profiles/BasicProfile-1.0-2004-04-16.html
WS-Notification	1.0	WS-Notification is a family of related white papers and specifications that define a standard Web services approach to	http://www-106.ibm.com/developerworks/library/specification/ws-notification/

		notification using a topic-based publish/subscribe pattern	
WS-Eventing	20040107	WS-Eventing allows Web services to subscribe to or accept subscriptions for event notification messages	http://msdn.microsoft.com/webservices/understanding/specs/default.aspx?pull=/library/en-us/dnglobspec/html/ws-eventing0104.asp
WS-Addressing	20040330	Web Services Addressing (WS-Addressing) defines endpoint references (destination, etc.) and standard messaging headers (message identifiers, et. Al.) in a manner independent of the underlying transport	http://xml.coverpages.org/WS-Addressing20040330.pdf/ (note: there is a new version as of 20040810)
WS-Policy	1.1	The Web Services Policy Framework (WS-Policy) provides a general purpose model and corresponding syntax to describe and communicate the policies of a Web Service	http://xml.coverpages.org/ws-policyV11.pdf
WS-ReliableMessage	March 2004	Defines a protocol that allows messages to be delivered reliably in the presence of software or network failures	http://msdn.microsoft.com/webservices/understanding/specs/default.aspx?pull=/library/en-us/dnglobspec/html/ws-reliablemessaging.asp
WSRP	1.0	Portal standard for web service access	http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wsrp

Table 2.1 Development Standards

2.2 Development Guideline Specifications

Development Guideline Specifications include other technologies, guidelines, and standards not mentioned above. Table 2.2 Development Guideline Specifications, does not have a version as they are single issue order guidelines.

Specification	Description	Reference
FIPS 140-2	Security Requirements for Cryptographic Modules	http://csrc.nist.gov/cryptval/140-2.htm
FIPS PUB 112	Password Usage 1985 guidance	http://www.itl.nist.gov/fipspubs/fip112.htm
FIPS PUB 180-2	Secure Hash Standard (SHS) (message digest algorithm), August 2002	http://csrc.nist.gov/publications/fips/
FIPS PUB 186-1	Digital Signature Standard (DSS), December 1998	http://www.itl.nist.gov/fipspubs/fip186.htm
FIPS PUB 46-2	Data Encryption Standard (DES), December 1993 (encryption algorithm, secret key)	http://www.itl.nist.gov/fipspubs/fip46-2.htm

FIPS PUB 46-3	The ESP Triple DES Transform, 8 January 1999 (encryption algorithm, secret key)	http://csrc.nist.gov/publications/fips/
IETF RFC 2459	Internet X.509 Public Key Infrastructure Certificate and CRL Profile, January 1999, IETF Proposed Standard as profiled by TWG-98-07.	http://www.ietf.org/rfc/rfc2459.txt
IETF RFC-1321	The MD5 Message-Digest Algorithm, April 1992	http://www.ietf.org/rfc/rfc1321.txt
IETF RFC-1828	IP Authorization Using Keyed MD5, August 1995	http://www.ietf.org/rfc/rfc1828.txt
IETF RFC-2040	The RC5, RC5-CBC, RC5-CBC-Pad, and RC5-CTS Algorithms, October 1996	http://www.faqs.org/rfc/rfc2040.txt
IETF RFC-2268	A Description of the RC2(r) Encryption Algorithm, January 1998	http://www.ietf.org/rfc/rfc2268.txt
IETF RFC-2313	KCS 1: RSA Encryption Version 1-5, March 1998 (public key)	http://www.ietf.org/rfc/rfc2313.txt
IETF RFC-2314, PKCS 10	Certification Request Syntax Version 1.5, March 1998	http://www.ietf.org/rfc/rfc2314.txt
ITU-T X.509	Information Technology - Open Systems Interconnection - The Directory: Authentication Framework, June 1997 as profiled by: IETF RFC 2459	http://www.itu.int/rec/recommendation.asp?type=products&parent=T-REC-x
RFC 2585	Internet X.509 Public Key Infrastructure	http://www.ietf.org/rfc/rfc2585.txt
RFC-2402	Authentication Header (AH), November 1998RFC-2406, IP Encapsulating Security Payload (ESP), November 1998	http://www.ietf.org/rfc/rfc2402.txt
RFC-2633	S/MIME Version 3 Message Specification, June 1999RFC-2632, S/MIME Version 3 Certificate Handling, June 1999	http://www.ietf.org/rfc/rfc2633.txt
RCF-1951	DEFLATE Compressed Data Format Specification. A lossless compression data format.	http://www.ietf.org/rfc/1951.txt
RSA Laboratories, PKCS 9	Selected Attribute Types	http://www.rsasecurity.com/rsalabs/node.asp?id=2125
TWG-98-07	Federal PKI X.509 Certificate and CRL Extensions Profile, 9 March 1998, as profiled by DoD Certificate Profile, as defined in X.509 Certificate Policy for the United States Department of Defense, version 1.5, 13 December 1999.	http://csrc.nist.gov/pki/twg/Archive/y1998/doc_reg_98.htm

Table 2.2 Development Guideline Specifications

2.3 Programming Languages

Table 2.3 Programming Languages provides Horizontal Fusion programming language versions for compatibility. For compatibility reasons, developers should adhere to the versions specified in this document unless otherwise specified by Horizontal Fusion management.

Language	Version	Description	Reference
CSS	1.0	Cascading Style Sheets	http://www.w3c.org/Style/CSS/
DocBook	4.2	XML schema (DTD) for documents and books	http://www.docbook.org
DOM	3.0	Document Object Model	http://www.w3.org/DOM/
HTML	4.01 / 3.2	HyperText Markup Language. Target version is 3.2, but 4.01 Transitional is acceptable.	http://www.w3.org/MarkUp/
ICML	1.0	Intelligence Community Markup Language – XML Metadata Standards	http://www.xml.saic.com/icml/
Java 2	1.4.2_04 or 1.4.2_05	Java Programming language. All packages relating to Java should maintain this version of the Java 2 Language	http://java.sun.com/
JavaScript	1.4	JavaScript. Client Side JavaScript must remain compatible with browser specifications	http://devedge.netscape.com/central/javascript/
OIL	DRAFT	Ontology Interchange Language	http://www.ontoknowledge.org/oil/
OWL	DRAFT	Ontology Web Language	http://www.w3.org/2004/OWL/
Perl	5.0	Perl Programming Language	http://www.perl.com/
RDF	1.0	Resource Description Framework	http://www.w3.org/RDF/
RSS	2.0	Really Simple Syndication	http://blogs.law.harvard.edu/tech/rss
SAML	1.0	Security Assertion Markup Language (SAML) Version 1.0 an OASIS Open Standard.	http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=security | http://www.oasis-open.org/committees/download.php/1383/oasis-sstc-saml-1.0-pdf.zip
SMIL	2.0	Synchronized Multimedia Integration Language	http://www.w3.org/AudioVideo/
SOAP	1.1	Simple Object Access Protocol Adjuncts. Must be interoperable with BEA Weblogic and Apache Axis.	http://www.w3.org/TR/soap/
SVG	1.1	Scalable Vector Graphics (SVG), W3C Candidate Recommendation, 02 November 2000. (a language for describing two-dimensional vector and mixed vector/raster graphics in XML) *	http://www.w3.org/TR/SVG
WSDL	1.1	Web Services Description Language	http://www.w3.org/TR/wsdl
WSFL	1.0	IBM Web Services Flow Language.	http://www-306.ibm.com/software/solutions/webser

			vices/pdf/WSFL.pdf http://xml.coverpages.org/wsfl.html
WSIA		Web Services for Interactive Applications Component Model	http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wsia
WSS-SC	1.0	Web Services Secure Conversation Language (WS-Secure Conversation)	http://www-106.ibm.com/developerworks/library/specification/ws-secon/
XFORMS	1.0	XML Forms Specification	http://www.w3c.org/MarkUp/Forms/
XACML	1.0	eXtensible Access Control Markup Language (XACML) Version 1.0 an OASIS Open Standard.	http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=xacml
XML	1.0.2	Extensible Markup Language v1.0 2nd Edition.	http://www.w3.org/TR/2000/REC-xml-20001006
XML Query	DRAFT	XML Query (Xquery) Requirements **	http://www.w3.org/TR/xquery-requirements/
XML Schema Data Types	1.0	XML Schema : Datatypes (XML Schema Part 2)	http://www.w3.org/TR/xmlschema-2/
XML Schema Structures	1.0	XML Schema : Structures (XML Schema Part 1)	http://www.w3.org/TR/xmlschema-1/
XPATH	1.0	XML Path Language Addressing Method.	http://www.w3.org/TR/xpath
XPOINTER	1.0	XML Pointer Language - Examination and Selection	http://www.w3.org/TR/WD-xptr
XTM	1.0	XML Topic Maps Classification Concept	http://www.topicmaps.org/xtm/1.0/
XSL	1.0	XML Style Language	http://www.w3c.org/Style/XSL/
XSL-FO	1.0	XSL Formatting Object	http://www.w3.org/TR/xsl/
XSLT	1.0	XML Translation	http://www.w3c.org/TR/xsl/

Table 2.3 Programming Languages

* SVG is in draft format and is not yet implemented by any user agents. Any intermediate rendering engine should adhere strictly to the SVG Draft as specified in order to remain interoperable with future implementations.

** XML Query is still in draft format and should be used with extreme caution as draft formats will change before final release.

2.3.1   Java Specific Technologies

While the use of Java to develop web services is not required, Java is crucial to the Horizontal Fusion *Mars* Portal and various other technologies. Table 2.3.1 Java Specific Technologies covers some Java technologies typically used in development of Web Services and portlets. The Horizontal Fusion *Mars* Portal is a shared environment and in many cases classes and packages are shared across the environment to many initiatives.

Many of the Java Technologies listed in Table 2.3.1 are included in the Java 2 Enterprise Edition (J2EE) package or the Java Web Service Development Pack (JWSDP) 1.4

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(http://java.sun.com/webservices/downloads/webservicespack.html); however, developers should verify the version of their package to ensure compatibility.

Name	Version	Description	Reference
AXIS	1.1	Apache Axis SOAP Toolkit	http://ws.apache.org/axis/
EJB	2.1	Enterprise JavaBeans Technology	http://java.sun.com/products/ejb/
Java RMI	1.4	Java Remote Method Invocation	http://java.sun.com/products/jdk/rmi/
Java Servlets	2.0	Java Servlet Pages	http://java.sun.com/products/jsp/
JavaMail	1.3.1	Javamail API	http://java.sun.com/products/javamail/
JAXB	1.0.3	Java Architecture for XML Binding	http://java.sun.com/xml/jaxb/
JAXM	1.1	Java API for XML Messaging	http://java.sun.com/xml/jaxm/
JAXP	1.2.6	Java API for XML Processing	http://java.sun.com/xml/jaxp/
JAXR	1.0.6	Java API for XML Registries.	http://java.sun.com/xml/jaxr/
JAX-RPC	1.1.2	Java API for XML-based RPC	http://java.sun.com/xml/jaxrpc/
JCA	1.4	J2EE Connector Architecture for building EIS adapters	http://java.sun.com/j2ee/connector/
JDBC	2.0	Java Database Connectivity 2.0 with backward compatibility to 1.0	http://java.sun.com/products/jdbc/
JNDI	1.2.1	Java Naming and Directory Interface	http://java.sun.com/products/jndi/
JMS	1.0	Java Messaging Service	http://java.sun.com/products/jms/
JNI	1.1	Java Native Interface	http://java.sun.com/docs/books/tutorial/native1.1/
JSSE	1.4	Java Secure Socket Extension	http://java.sun.com/products/jsse/
JTA	1.0.1 B	Java Transaction API	http://java.sun.com/products/jta/
JTS	1.1	Java Transaction Service	http://java.sun.com/products/jts/
Log4j	1.2.8	Log4j is the de facto logging framework written in the Java language; the Log4j environment has 3 components: loggers, layouts, and appenders	http://logging.apache.org/log4j/docs/
SAAJ	1.2.1	SOAP with Attachments API for Java	http://sun.java.com/xml/saaj/
WSDL4J	1.4	Web Services Description Language for Java Toolkit	http://oss.software.ibm.com/developer works/projects/wsdl4j

Table 2.3.1 Java Specific Technologies

JWSDP 1.4 contains the following technologies:

- XML and Web Services Security v1.0 EA3
- XML Digital Signatures 1.0 EA
- Java Architecture for XML Binding (JAXB) v1.0.3 FCS
- Java API for XML Processing (JAXP) v1.2.6 FCS
- Java API for XML Registries (JAXR) v1.0.6 FCS
- Java API for XML-based RPC (JAX-RPC) v1.1.2 FCS
- SOAP with Attachments API for Java (SAAJ) v1.2.1 FCS
- JavaServer Pages Standard Tag Library (JSTL) v1.1 FCS
- Java WSDP Registry Server v1.0_06 EA

- Ant Build Tool 1.5.4 FCS
- WS-I Attachments Sample Application 1.0 EA

2.4   Protocols andTransfer

Table 2.4contains the primary network and transfer protocols and specifications. This includes transfer methods, network protocols and standards, transmission specifications, and some network security standards.

Protocol	Version	Description	Reference
DASL	DRAFT	DAV Searching and Locating Protocol to search WebDAV repositories	http://www.webdav.org/dasl/
DNS	FINAL	IETF Standard 13/RFC-1034/RFC-1035, Domain Name System (DNS), November 1987	http://www.ietf.org/rfc/rfc1035.txt
DNS Negative Caching	FINAL	IETF RFC-2308, Negative Caching of DNS Queries, March 1998	http://www.ietf.org/rfc/rfc2308.txt
IPsec	FINAL	IP Security Protocol	http://www.ietf.org/html.charters/ipsec-charter.html
LDAP Access Protocol	3.0	IETF RFC-2251, Lightweight Directory Access Protocol (v3), December 1997	http://www.ietf.org/proceedings/98aug/I-D/draft-ietf-asid-ldapv3-dynamic-07.txt
LDAP Technical Specification	3.0	IETF RFC-3377, Lightweight Directory Access Protocol (v3): Technical Specification, September 2002	http://www.ietf.org/rfc/rfc3377.txt
MIME	FINAL	IETF RFCs 2045-2049, Multipurpose Internet Mail Extensions (MIME) Parts 1-5, November 1996	
MIME Extensions	FINAL	IETF RFC-2231, MIME Parameter Value and Encoded Word Extensions: Character Sets, Languages, and Continuations, November 1997	
NetCDF	4	An interface for array-oriented data access with library for implementation.	http://my.unidata.ucar.edu/content/software/netcdf/index.html
RFC X.500	FINAL	LDAP Based Standard	http://rfc.net/rfc2247.html
SMTP	FINAL	Simple Mail Transaction Protocol	http://www.ietf.org/rfc/rfc0821.txt
SSH	2.0	Secure Shell	http://www.ssh.com/
SSL	2.0		http://wp.netscape.com/eng/ssl3/draft302.txt
TELNET	FINAL	Telnet Protocol Specification	http://www.ietf.org/rfc/rfc495.txt
WEBDAV	Feb. 1999	HTTP Extensions for Distributed Authoring	http://www.webdav.org/ http://www.ietf.org/rfc/rfc2518.txt
WS-R	FINAL	Web Services Routing (WS-Routing) Specification	http://msdn.microsoft.com/library/en-us/dnglobspec/html/ws-routing.asp
WSS	1.0	Web Services Security: SOAP Message	http://www.oasis-

		Security Spec 1.0	open.org/committees/tc_home.php?wg_abbrev=wss
WSS-SAML	1.0	Web Services Security: SAML Token Profile (Draft 08, 12/16/03)	http://www.oasis-open.org/apps/org/workgroup/wss/
WSSTP	DRAFT	WS-Security SAML Token Profile, Working Draft 06, Feb 21, 2003	http://www.oasis-open.org/commitees/wss/documents/WSS-SAML-06.pdf
X.400	FINAL	X.400 Email Protocol	http://www.itu.int/rec/recommendation.asp?type=products&parent=T-REC-x
XKMS	FINAL	XML Key Management Specification (XKMS)	http://www.w3.org/TR/xkms/
XMLDSIG	FINAL	XML Signatures Syntax and Processing	http://www.w3.org/TR/xmldsig-core/
XMLENC	FINAL	XML Encryption Syntax and Processing	http://www.w3.org/TR/xmlenc-core/
XMLP	20020626	XML Protocol Requirements	http://www.w3.org/TR/2002/WD-xmlp-reqs-20020626

Table 2.4 Protocols andTransfer

2.5 File Formats

File format versions are essential to maintaining interoperability with current and future technologies. Table 2.5 covers the variety of file format versions the Horizontal Fusion Portfolio has isolated.

Format	Version	Description	Reference
GZIP	4.3	GZIP Compressed Archive Format	http://www.ietf.org/rfc/rfc1952.txt
ISO 10646	FINAL	ISO/IEC 10646-1:1993(E) Information Technology--Universal Multiple-octet Coded Character Set (UCS)	http://www.ansi.org/
ISO/IEC 8859-1	FINAL	ISO/IEC 8859-1:1998, Information Technology. 8-Bit Single-Byte Coded Graphic Character Sets. Part 1: Latin Alphabet No. 1	http://www.ansi.org/
JPEG	1.02	JPEG File Interchange Format (JFIF), Version 1.02, C-Cube Microsystems for raster graphics data encoded using the ISO/IEC 10918-1:1994, Joint Photographic Experts Group (JPEG) algorithm	http://www.jpeg.org/ | http://www.w3.org/Graphics/JPEG/
MPEG	1.0	Moving Picture Experts Group (MPEG) standards for coded representation of digital audio and video	
NITF	2.1	National Imagery Transition Format	http://www.ismc.nga.mil/ntb/announce/2001/announcement_dec2001.htm
PDF	1.3.2	Adobe ™ Printable Document Format	http://partners.adobe.com/asn/tech/pdf/specifications.jsp
PNG	2.0	Portable Network Graphics (PNG) IETF RFC	http://www.libpng.org/pub/png/

		2083, PNG Specification	
RTF	1.6	Rich Text Format (Text documents)	http://support.microsoft.com/default .aspx?scid=kb;EN-US;269575
TIFF	4.0	Tagged Image File Format	http://busca.adobe.com/search?q=ca che:fI6534NTxps:http://partners.ado be.com/asn/developer/pdfs/tn/TIFFp hotoshop.pdf+TIFF+Standard&restr ict=Adobe_com&site=AdobeCom& output=xml_no_dtd&client=Adobe Com&access=p&proxystylesheet=h ttp%3A%2F%2Fwww.adobe.com% 2Fspecial%2Fsearch%2Fadobecom. xsl
Unicode	1.1/1.0	"The Unicode Standard, Version 1.1": Version 1.0, Volume 1 (ISBN 0-201-56788-1), Version 1.0, Volume 2 (ISBN 0-201-60845-6), and "Unicode Technical Report #4, The Unicode Standard, Version 1.1" This standard includes all languages.	http://www.unicode.org/
ZIP	8.0	Winzip File Format (ZIP). Must be compatible with version 8 of Winzip	http://www.winzip.com/aboutzip.ht m

Table 2.5 File Formats

2.6 Security Standards

Security Standards include other technologies, guidelines, and standards not mentioned above. These guidelines do not have a version as they are single issue order guidelines. Table 2.6 Security Standards provides a brief list of some of the Security Specifications used within the Horizontal Fusion Portfolio.

Specification	Description	Reference
DCID 6/3	Protecting Sensitive Compartmented Information within Information Systems	
JDCSISSS	Joint DoDIIS/Cryptologic SCI Information Systems Security Standards	
DoDIIS C&A Guide	DoD Intelligence Information Systems (DoDIIS) Security Certification and Accreditation Guide	
DITSCAP	DoD Information Technology Security Certification and Accreditation Process	http://iase.disa.mil/ditscap/

Table 2.6 Security Standards

3   ENTERPRISE STANDARDS AND SPECIFICATIONS

While many of the standards and specifications used within the Horizontal Fusion Portfolio are commercial or public standards, the Portfolio had to include and even create new standards and specifications for the enterprise. The following section outlines the Standards and Specifications used/supported in the Horizontal Fusion SOA.

3.1   Enterprise Level Deployment Environment

Horizontal Fusion uses a baseline of BEA WebLogic applications. Portlet developers are encouraged to develop to the JSR-168 specification; however, developers should be aware that BEA WebLogic is not JSR-168 certified and implements the portal environment in such a way that JSR-168 certified portlets will not function without integration into the new environment. Therefore, developers are encouraged to create portlets or test portlets in the BEA environment as specified below.

Category	Software
Application Server	BEA WebLogic Application Server 8.1 (SP3)
Enterprise Portal	BEA WebLogic Portal 8.1
Platform	BEA WebLogic Platform 8.1
Java Compiler	J2SDK 1.4.2_03, 1.4.2_04, or 1.4.2_05
Browsers	Internet Explorer 5.5 and higher

3.2   Net-Centric Enterprise Service Specifications

3.2.1   Security Services

Name	Description	Version
NCES Security Services	Horizontal Fusion Security Services WSDL Specifications	0.3

3.2.2   Services Discovery

Name	Description	Version
NCES Discovery Services	Horizontal Fusion Security Services WSDL Specifications	0.3

3.2.3 Content Discovery

Name	Description	Version
SWS	Search Web Service Specifications (SWS) WSDL	1.3.0
RWS	Registration Web Service Specifications (RWS) WSDL	1.1.0
DoD XML Registry	DoD Discovery Metadata Specification XML alpha schema implementation (URL:http://diides.ncr.disa.mil/shade/index.cfm	1.006

3.2.4 Metadata Discovery

Name	Description	Version
DoD XML Registry	DoD Discovery Metadata Specification XML alpha schema implementation (URL:http://diides.ncr.disa.mil/shade/index.cfm)	
NCES Metadata Discovery	DoD Data Emporium, Programmer's Manual (PM) for Metadata Registry and Clearinghouse 4.0, Query Web Service and Search Web Service {30 March 2004}	

3.2.5 Mediation/Metadata

Name	Description	Version
DoD XML Registry	DoD Discovery Metadata Specification XML alpha schema implementation (URL:http://diides.ncr.disa.mil/shade/index.cfm)	
XML Translation Service	XML Translation Service Application Program Interface (API) specification for Network Centric Enterprise Services (NCES) {26 March 2004}	0.21
XSL Translations	XSL Translations and XSD Schemas registered into the DoD Metadata Registry	

3.2.6 Person Discovery

Name	Description	Version
Person Discovery	Person Discovery Service (PDS) Specification WSDL	1.0.8

3.2.7 Enterprise Service Management

TBD

3.2.8 Mediation: Messaging

Name	Description	Version
Messaging	Messaging Specification	1.3
Syndication	Syndication Services (Alerts) WSDL	1.0.6

3.2.9 Collaboration

Name	Description	Version
Collaboration	Collaboration Specification	1.0
XMPP	Extensible Messaging and Presence Protocol (XMPP) http://www.ietf.org/rfc/rfc2779.txt	
T120	Data Protocols for Multimedia Conferencing http://www.itu.int/rec/recommendation.asp?type=folders&lang=e&parent=T-REC-T.120	(Future Use)
H.323	Packet-based Multimedia Communications Systems http://www.itu.int/rec/recommendation.asp?type=folders&lang=e&parent=T-REC-H.323	(Future Use)

3.2.10 C2 Visualization

Name	Description	Version
MIL-STD 2525	Military Standard (Mil STD) 2525 symbology for track visualization	
WFS	Web Feature Service (WFS) v1.0 – http://www.opengis.org/docs/02-058.pdf OGC Web Feature Service for XML features (geospatial and attributes)	1.0
WMS	Web Map Service (WMS) v1.1.1 – http://www.opengis.org/docs/01-068r2.pdf OGC Web Map Service for layered geospatial raster images	1.1.1
WRS	Web Registry Server (WRS) v0.0.2 – http://www.opengis.org/docs/01-024r1.pdf OGC Web Registry Service for browsing/selecting WFS, WMS services	0.0.2

3.2.11 Storage

Name	Description	Version
WebDAV	HTTP Extensions for Distributed Authoring. http://www.ietf.org/rfc/rfc2518.txt http://www.webdav.org	
WebDAV	Versioning Extensions to WebDAV (Web Distributed Authoring and Versioning) http://www.ietf.org/rfc/rfc3253.txt; http://www.webdav.org	

3.3 Enterprise Data Specifications

Name	Description	Version
Horizontal Fusion Common Tactical Data and Services Standards	A common set of track data and service standards for data providers and users. 20 April 2004.	1.0
Horizontal Fusion Ontology	Ontology will be used to categorize the Horizontal Fusion portfolios' data for content discovery. 20 April 2004.	1.0
Horizontal Fusion Person Specification	Specification for biographic data exchange to enhance knowledge discovery/mining. 20 April 2004.	1.0
Environmental Visualization XML Schemas	Specification for Meteorology and Oceanography (METOC) data products. 18 February 2004.	1.0.7
General Military Information (GMI)/MIDB (Horizontal Fusion MIDB Wrappers)	General purpose military information via web service wrapper for equipment, facility and unit. 9 February 2004	1.01
DoD Discovery Metadata Specification	DoD Standards for discovery metadata by defining metadata elements. 29 September 2003	1.0
Geo-spatial Standards and Specifications		
ISO 19115	International Metadata Standard for describing digital geographic data by defining metadata elements and establishing a common set of metadata terminology, definitions and extension procedures. 12 October 2003.	2.3
WFS	Web Feature Service (WFS) v1.0 – http://www.opengis.org/docs/02-058.pdf OGC Web Feature Service for XML features (geospatial and attributes)	1.0

Name	Description	Version
WMS	Web Map Service (WMS) v1.1.1 – http://www.opengis.org/docs/01-068r2.pdf OGC Web Map Service for layered geospatial raster images	1.1.1
WRS	Web Registry Server (WRS) v0.0.2 – http://www.opengis.org/docs/01-024r1.pdf OGC Web Registry Service for browsing/selecting WFS, WMS services	0.0.2

3.4 Enterprise User Configuration

This section covers the software packages and version numbers of these packages that should be used to test development and deployment. This section is provided merely for reference purposes only and is not intended to be a guide to setting up a proper workstation configuration for use within the Horizontal Fusion Portfolio.

Some components within the Horizontal Fusion Portfolio require the current user to have administration rights to the workstation in order to install local components. For example, Java QuickStart applications must be installed as an administrator as well as any Microsoft Active-X components.

Software	Version	Description
Microsoft Windows	2003, XP	Microsoft Windows Operating System
JRE	1.4.2_04	Java2 Runtime Environment, Java plug-in for web browsers.
MS Internet Explorer	5.5 or higher	Microsoft Internet Explorer web browser.
Acrobat Reader	6.0	Adobe Acrobat Reader for viewing PDF documents.
Mozilla	1.6	Mozilla web browser.
QuickTime	6.5.1 or higher	Apple QuickTime video player. Install with the Java Component.
MS Office	2000,2003, XP	Microsoft Office products for viewing of documents. Viewers can be substituted where possible, for viewing purposes only. Editing requires full versions of Microsoft Office.

4 ACRONYMS

Acronym	Meaning
AH	Authentication Header
ANSI	American National Standards Institute
API	Application Program Interface
ASD/NII	Assistant Secretary of Defense for Networks and Information Integration
C&A	Certification and Accreditation
CES	Core Enterprise Services
CSS	Cascading Style Sheet
DASL	DAV Searching and Locating Protocol
DAV	Distributed Authoring and Versioning
DCID	Director Central Intelligence Directive
DDMS	DoD Discovery Metadata Specification
DES	Data Encryption Standard
DITSCAP	DoD Information Technology Security Certification and Accreditation Process
DNS	Domain Name System
DoD	Department of Defense
DoDIIS	DoD Intelligence Information Systems
DOM	Document Object Model
DSS	Digital Signature Standard
EJB	Enterprise JavaBeans
ESM	Enterprise Service Management
ESP	Encapsulating Security Payload
FIPS	Federal Information Processing Standards
GIG-BE	Global Information Grid Bandwidth Expansion
GMI	General Military Information
HTML	HyperText Markup Language
ICML	Intelligence Community Markup Language
IEC	International Electrotechnical Commission
IETF	Internet Engineering Task Force
IP	Internet Protocol
IPsec	IP Security Protocol
ISO	International Organization for Standards
IT	Information Technology
ITU	International Telecommunication Union
J2EE	Java 2 Enterprise Edition

Acronym	Meaning
JAXB	Java Architecture for XML Binding
JAXM	Java API for XML Messaging
JAXP	Java API for XML Processing
JAXR	Java API for XML Registering
JAX-RPC	Java API for XML-based RPC
JCA	J2EE Connector Architecture
JDBC	Java Database Connectivity
JDCSISSS	Joint DoDIIS/Cryptologic SCI Information System Security Standards
JFIF	JPEG File Interchange Format
JIVA	Joint Intelligence Virtual Architecture
JMS	Java Messaging Service
JNDI	Java Naming and Directory Interface
JNI	Java Native Interface
JPEG	Joint Photographic Experts Group
JRE	Java Runtime Environment
JSR	Java Specification Request
JSSE	Java Secure Socket Extension
JSTL	Java Server pages Standard Tag Library
JTA	Joint Technical Architecture
JTA	Java Transaction API
JTRS	Joint Tactical Radio Systems
JTS	Java Transaction Service
JWSDP	Java Web Service Development Pack
LDAP	Lightweight Director Access Protocol
METOC	Meteorology and Oceanography
MIL-STD	Military Standard
MIME	Multipurpose Internet Mail Extensions
MPEG	Moving Picture Experts Group
NCES	Net-Centric Enterprise Services
NITF	National Imagery Transition Format
OIL	Ontology Interchange Language
OWL	Ontology Web Language
PDF	Printable Document Format
PDS	Person Discovery Service
PKCS	Public Key Cryptography Standards
PKI	Public Key Infrastructure
PNG	Portable Network Graphics
RDF	Resource Description Framework
RFC	Request for Comments
RMI	Remote Method Invocation
RSS	Really Simple Syndication

Acronym	Meaning
RWS	Registration Web Service
S/MIME	Secure Multipurpose Internet Mail Extensions
SAAJ	SOAP with Attachments API for Java
SAML	Security Assertion Markup Language
SATCOM	Satellite Communications
SCI	Special Compartmented Information
SDK	Software Development Kit
SHS	Secure Hash Standard
SMIL	Synchronized Multimedia Integration Language
SMTP	Simple Mail Transaction Protocol
SOA	Services-Oriented Architecture
SOAP	Simple Object Access Protocol
SSH	Secure Shell
SVG	Scalable Vector Graphics
SWS	Search Web Service
TIFF	Tagged Image File Format
TWG	Technical Working Group
UCS	Universal Multiple-octet Coded Character Set
UDDI	Universal Description, Discovery, and Integration
WFS	Web Feature Service
WMS	Web Map Service
WRS	Web Registry Server
WS	Web Services
WSDL	Web Service Description Language
WSFL	IBM Web Services Flow Language
WS-I	Web Services Interoperability
WSIA	Web Services for Interactive Applications
WSRP	Web Services for Remote Portals
WSS	Web Services Security
WSS-SC	Web Services Secure Conversion Language
WSSTP	WS-Security SAML Token Profile
XACML	EXtensible Access Control Markup Language
XFORMS	XML Forms Specification
XKMS	XML Key Management Specification
XML	EXtensible Markup Language
XMLDSIG	XML Signatures Syntax and Processing
XMLENC	XML Encryption Syntax and Processing
XMLP	XML Protocol Requirements
XMPP	Extensible Messaging and Presence Protocol
XPATH	XML Path Language
XPOINTER	XML Pointer Language

Acronym	Meaning
XSL	XML Style Language
XSL-FO	XSL Formatting Object
XSLT	XML Translation
XTM	XML Topic Maps